

II. REMARKS

With the above amendments, claims 1-3 have been cancelled without prejudice, claims 4-6 have been amended, and new claims 9-21 have been added. More specifically, claim 4 has been amended to incorporate subject matter from original claim 1, and to recite

“wherein the light guide plate comprises
i. an entry face that light enters at one side of the light guide plate;
ii. an exit face disposed on a side of the light guide plate adjacent
to a liquid crystal display device; and
iii. a lower face disposed opposing the side of the light guide plate
nearest to the liquid crystal display device,”

as supported on page 9, line 19, to page 10, line 18, and Figs. 8, 9 and 11, of Applicants’ disclosure as originally filed. Claim 4 has also been amended to recite “a reflector that comprises a structured face, wherein the reflector is disposed at the lower face of the light guide plate” as supported by original claims 1 and 4, and by page 10, lines 1-13, and as shown in Fig. 11, of Applicants’ disclosure as originally filed. Claim 4 has also been amended to recite that “a crest line direction of the prism elements is disposed orthogonal to the entry face of the light guide plate” as supported on page 17, lines 10-12, of Applicants’ English specification as originally filed.

Claims 5 and 6, which depend upon claims 4 and 5, respectively, have been amended in accordance with the amendments to claim 4. New claim 9 depends upon claim 4, and recites subject matter supported by claim 6.

New claims 10 and 11 depend upon claims 5 and 6, respectively, and further recite that

“the reflective elements comprise V-shaped grooves, wherein an inclined face of the grooves is directed to face light sources so that an angle of inclination of the inclined face brings light from the entry face gradually to a first angle below a second angle for total internal reflection,”

as supported on page 12, line 26, to page 13, line 3, and by Fig. 11, of Applicants’ disclosure as originally filed.

New claims 12-17, which depend upon claims 4-6 and 9-11, respectively, further recite that

“a rate of reflectivity of the reflector is not less than 75%, and a repetition cycle of the prism elements is 1-200 μm , and an angle formed by an oblique side of the trapezoidal section and a base thereof is 20-70° and a ratio of the sum of a length of an upper side of the trapezoidal section and a length of a gap between prism elements is a ratio in the range of 0.05-0.5 in relation to the repetition cycle of the prism elements,”

as supported on page 7, line 16, to page 8, line 9, of Applicants’ English specification as originally filed.

New claim 18 depends upon claim 4, and additionally recites that “a height of the trapezoidal section of prism elements is constant” as supported by previous claims 2 and 7.

New claim 19 depends upon claim 4, and additionally recites that “a height of the trapezoidal section of prism elements is progressively decreasing” as supported by previous claims 3 and 8.

New claim 20 depends upon claim 4, and additionally recites

“an optical sheet disposed above the exit face of the light guide plate, wherein the optical sheet has a flat upper face and a lower face, and wherein reflective grooves forming a continuous prism-shaped construction are disposed on the lower face of the optical sheet,”

as supported on page 16, lines 9-24, and by Figs. 17 and 18, of Applicants’ disclosure as originally filed.

New claim 21 depends upon claim 4, and additionally recites that “the prism elements comprise a variety of prism films” as supported on page 17, lines 10-12, of Applicants’ English specification as originally filed.

The present amendment adds no new matter to the above-captioned application.

A. The Invention

The present invention pertains broadly to a backlight device, such as may be used to illuminate a liquid crystal display device. In accordance with an embodiment of the present invention, a backlight device is provided that includes features recited by independent claim 4. Various other embodiments, in accordance with the present invention, are recited by the dependent claims.

An advantage provided by the various embodiments of the present invention is that a backlight device is provided that has a decrease in darkness occurring between light sources and of hotspots and bright line occurring in the region of light input, which realizes less unevenness and improved uniformity of luminance.

B. The Rejections

Claims 1-8 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Katsu et al. (U.S. Patent Application Publication No. US 2002/0154087, hereinafter the “Katsu Publication”) in view of Boyd et al. (U.S. Patent Application Publication No. US 2002/0145593, hereinafter the “Boyd Publication”).

In view of the present amendment, Applicants respectfully traverse the Examiner’s rejections and request reconsideration of the above-captioned application for the following reasons.

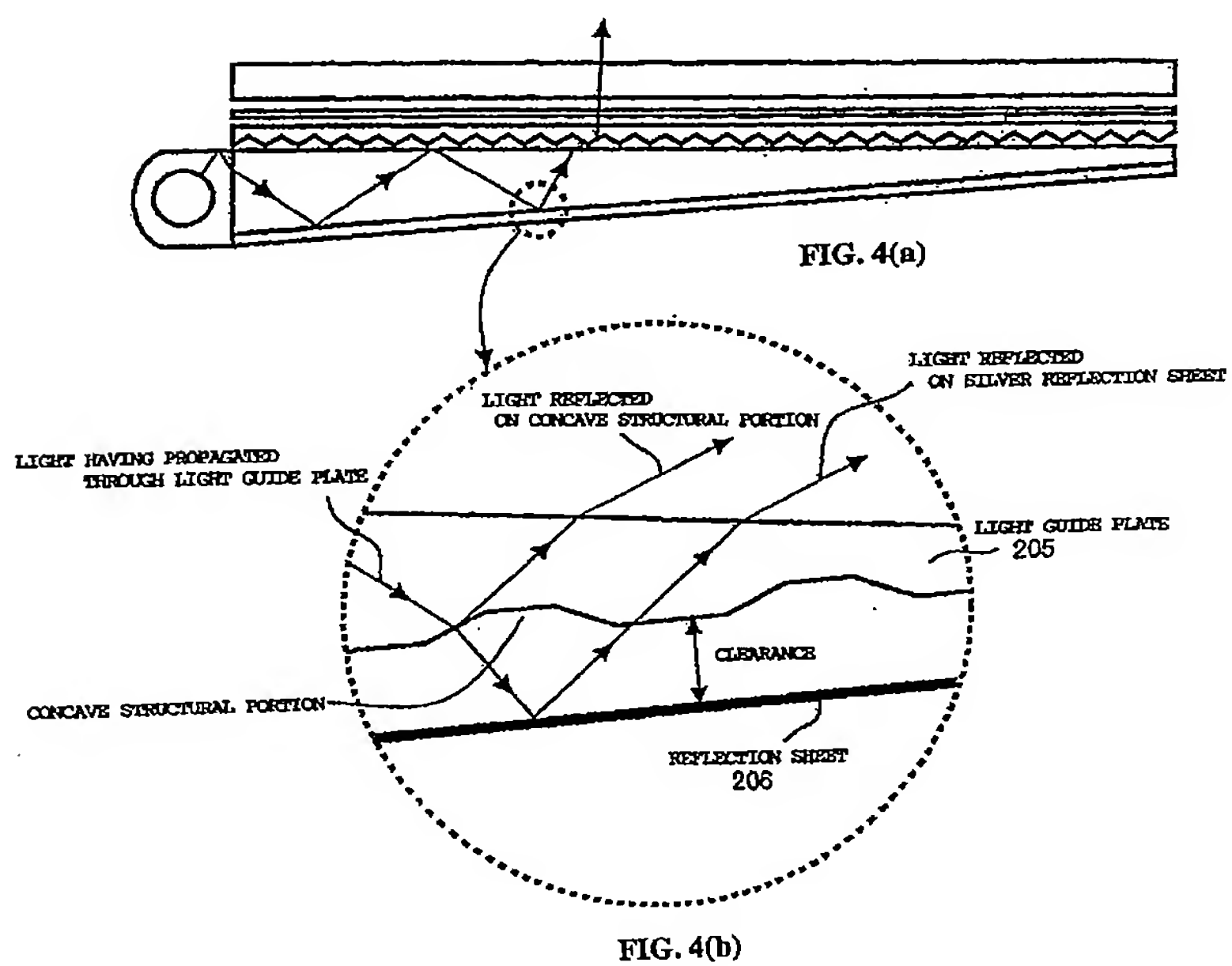
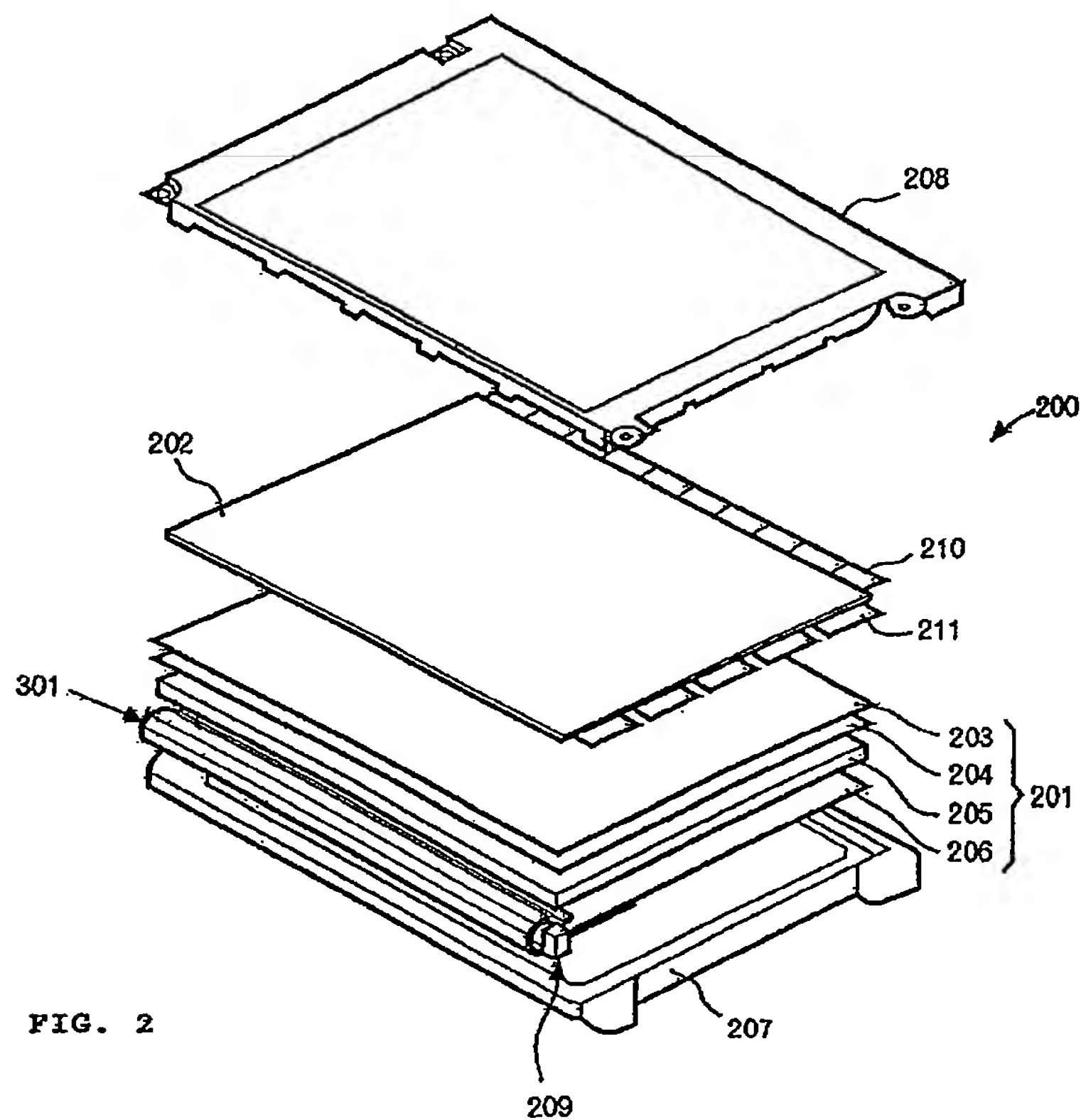
C. Applicants’ Arguments

A prima facie case of obviousness requires a showing that the scope and content of the prior art teaches each and every element of the claimed invention, and that the prior art provides some teaching, suggestion or motivation, or other legitimate reason, for combining the references in the manner claimed. KSR International Co. v. Teleflex Inc., 127 S.Ct. 1727,

1739-41 (2007); In re Oetiker, 24 U.S.P.Q.2d 1443 (Fed. Cir. 1992). In this case, the Examiner has not established a prima facie case of obviousness against claims 4-6 and 9-21 of the above-captioned application because the combination of the Katsu Publication and the Boyd Publication fails to teach, or even suggest, each and every claimed limitation, arranged as in the claims.

i. The Katsu Publication

The Katsu Publication discloses a “light source device, display device and reflection sheets for use therewith,” which pertains to a light source device and display device (200) capable of suppressing occurrence of unevenness in luminance therefrom by using a light guide (205) with concave or convex structural portions in combination with a reflection layer (206) disposed adjacent the light guide and including a plurality of spacers for strategically positioning the layer's reflecting surface from the light guide (205), (See Abstract of the Katsu Publication, and ¶¶ [0029] to [0031], and Fig. 2). The liquid crystal display device (200) is shown in Fig. 2, which is reproduced below. Light within the light guide (205) is both reflected from the guide (e.g., to an adjacent display panel) or emitted onto the reflecting surface and passed back through the guide for eventual emission (e.g., to the same display panel), as shown in Figs. 4(a) and 4(b). Figs. 4(a) and 4(b) of the Katsu Publication are also reproduced below.



The Katsu Publication further discloses a reflection sheet (206) that includes a base sheet, a reflection layer and a plurality of columnar structural portions (See Abstract of the

Katsu Publication, and ¶ [0018]). However, as admitted by the Examiner (Office Action, mailed January 31, 2011, at 2, lines 18-19), the Katsu Publication does not teach, or even suggest, (i) “the structured face includes an iteration of prism elements of trapezoidal section” as recited by independent claim 4. However, this is not the only deficiency in the disclosure of claim 4, as amended.

The Katsu Publication also does not teach, or suggest, (ii) “wherein a crest line direction of the prism elements is disposed orthogonal to the entry face of the light guide plate” as recited by claim 4. The Katsu Publication also does not teach, or suggest, (iii) the subject matter of new claims 10-21.

ii. The Boyd Publication

The Boyd Publication discloses a “frontlit illuminated touch panel,” as shown in Fig. 1 reproduced below for convenience, wherein the frontlit touch panel is for use with a reflective light valve, wherein the frontlit touch panel (10) comprises a front light guide (12) having at least one light input face (14) that supplies light to the guide, a viewing face (18), a light output face (16) opposite the viewing face (18), and at least one component (26) of a touch-sensitive transducer (23), (See Abstract of the Boyd Publication, and ¶¶ [0033] to

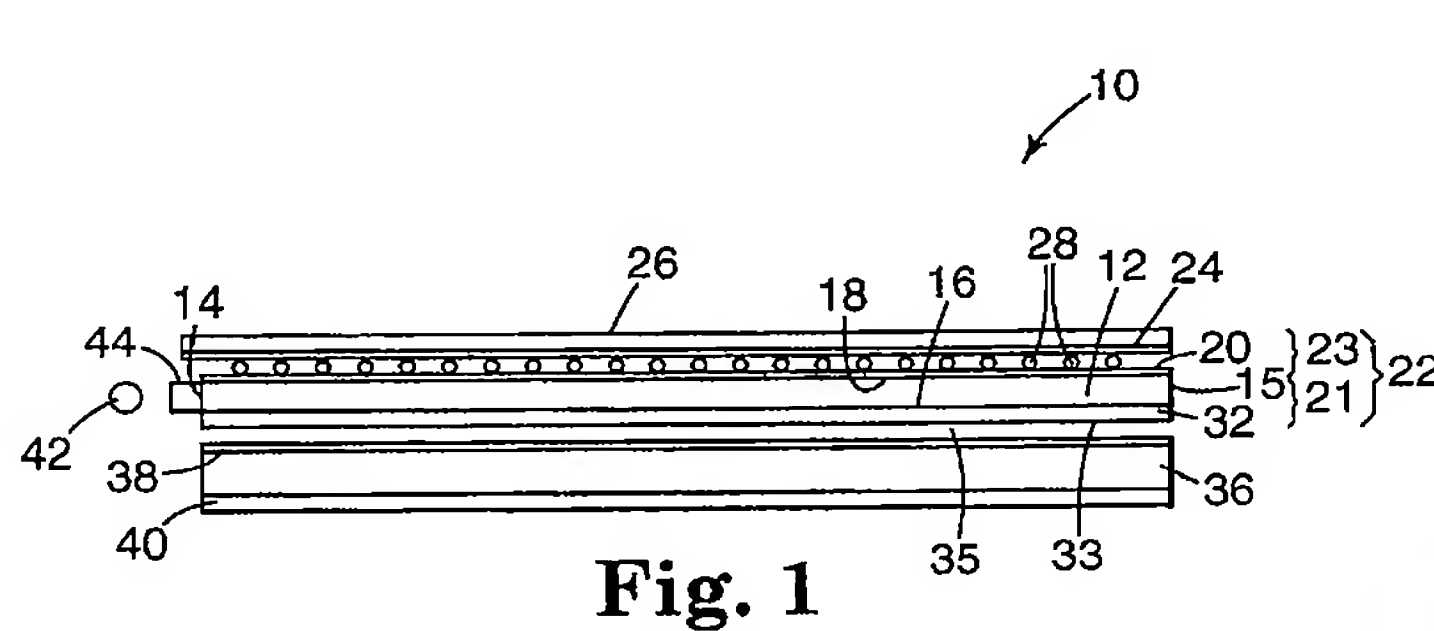


Fig. 1

[0034]). The Boyd Publication further discloses that the light output face (16) has a light extraction layer (32) thereon having a substantially flat light exit face and containing buried reflective facets that extract supplied light from the guide through the light exit face (See

Abstract of the Boyd Publication, and ¶ [0056]). According to the Boyd Publication, the touch panel can be used with a light source, reflective light valve and suitable control electronics to form a compact illuminated touch panel display assembly (See Abstract of the Boyd Publication).

However, the Boyd Publication does not teach, or suggest, (i) that “a crest line direction of the prism elements is disposed orthogonal to the entry face of the light guide plate” as recited by claim 4. The Boyd Publication also does not teach, or suggest, (ii) the subject matter of new claims 10-21.

iii. Summary of the Disclosures

The combination of the Katsu Publication and the Boyd Publication does not teach, or even suggest, (i) that “a crest line direction of the prism elements is disposed orthogonal to the entry face of the light guide plate” as recited by claim 4, as amended, and (ii) the subject matter of new claims 10-21. Therefore, the Examiner has not established that the combination of the Katsu Publication and the Boyd Publication teaches, or suggests, each and every claimed limitation, arranged as in the claims.

The presently claimed invention, as recited by independent claim 4, includes the feature wherein “a crest line direction of the prism elements is disposed orthogonal to the entry face of the light guide plate.” This feature is described on page 17, lines 10-12, of Applicants’ specification, and this feature provides the particularly advantageous effect, or unexpected result, of having a decrease in darkness occurring between the light sources and of hotspots and bright line occurring in the region of light input, which realizes less unevenness and improved uniformity of luminance, as described on page 4, lines 14-16, of Applicants’ original English specification.

For all of the above reasons, the Examiner has not established a prima facie case of obviousness against amended claims 4-6 and 9-21 of the above-captioned application.

III. CONCLUSION

The Examiner has not established a prima facie case of obviousness against claims 4-6 and 9-21, as amended, because the combination of the Katsu Publication and the Boyd Publication does not teach, or even suggest, (i) “a crest line direction of the prism elements is disposed orthogonal to the entry face of the light guide plate” as recited by claim 4, and (ii) the subject matter of new claims 10-21.

For all of the above reasons, claims 4-6 and 9-21 are in condition for allowance, and a prompt notice of allowance is earnestly solicited.

Questions are welcomed by the below-signed attorney for Applicants.

Respectfully submitted,

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